ABSTRACT OF DISCLOSURE

The present disclosure provides efficient and reproducible methods for individually synthesizing oligomers in a parallel manner (*e.g.*, oligonucleotides) on a solid support to produce pools of oligomers. Pools of oligonucleotides can be used for a variety of genomic and proteomic applications, including synthesis of genes or long DNA of any arbitrary sequence, PCR template amplification, and to generate primers for multiplexing PCR or transcription. Rapid availability of these oligonucleotide products will greatly accelerate the processes of de novo protein design, vaccine development, production of short RNA fragments, such as siRNA, oligonucleotide-based drug screening, and SNP sample preparation.